models were not able to do so. The present study suggests that the similarity of the field distribution depression is taken into account.

HIGH-RESOLUTION SPECTROSCOPY OF THE A-X AND B-X SYSTEMS OF CH IN COMETS

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We analyzed the A-X(0-0) band of CH, which appears in high-resolution spectra of comets Austin(1990 V)and Wilson(1987 VI),in order to understand fluorescence and collisional processes that influence the rotational structure of the A-X(0-0)band. Some of the weak lines of the A-X(0-0) band are clearly resolved, which have not been previously resolved with relatively low-resolution spectroscopy. We unambiguously confirmed the B-X(0-0)band lines around 3890 Å in a comet Austin spectrum. The B-X(0-0)band lines in cometary spectra had been suspected previously and they had not been clearly identified because of strong adjacent CN and C_3 bands. In order to analyze the cometary spectra we have conducted two different fluorescence calculations a single-cycle fluorescence and fluorescent equilibrium. The fluorescent equilibrium model includes infrared and ultraviolet fluorescence processes as well as electron and neutral collisional effects, and therefore the model is a function of cometocentic distance. We found that single-cycle fluorescence models with a Boltzmann distribution in the X state fit the observed spectra better than the fluorescenct equilibrium models. However, single-cycle fluorescence models with two different temperatures(ex.150K for F2 state and 300K for F1 state)in the X state fit the Austin and Wilson spectra much better than the single-cycle fluorescence model with the same temperature(ex. 150K)for F1 and F2 states. This suggests that we are observing two different Boltzmann distributions of nascent, short-life CH radicals right after they were produced by photodissociations of parent molecules. We derived X state rotational temperatures of 150 +/- 20 K for F2 states and 300 +/- 20 K for F1 states of the A-X and B-X bands observed in the comet Austin spectra, and the same temperatures for the A-X band in the comet Wilson spectrum. In the spatially resolved spectra of comet Qustin, we found negligible Greenstein effects. We also compared the single-cycle fluorescence models with moderate resolution spectra of comets P/Halley and Ikeya (1963 I), and found that single-cycle fluorescence models again fits the observations better than fluorescent equilibrium models. We however found that a model with a single temperature(150 K) for the F1 and F2 states fits the Halley spectrum almost perfectly. This suggests that the X state of the CH radicals in Halley accomplished a Boltzmann distribution because of high collision rates in the caused by high as production rate of Halley. For comet Ikeya we found 200K and 350K for the F2 and F1 states. The high temperatures might be caused by small(0.72 AU)heliocentric distance and/or relatively high gas production rate of comet Ikeya at the time of the observation. We also discuss possible parent molecules of CH and long lifetimes of the parent molecules, which may explain extensive emissions of CH up to 10^5km from the nucleus dec\spite its short lifetime.